

CENTRAL INTELLIGENCE AGENCY

## REPORT

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Research Institute of Manfred  
von Ardenne, Dresden

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REPORT NO.

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- c. The second two-family house contains, among other rooms, several electro-medical laboratories, a laboratory for employment of isotopes, a metallurgical laboratory and a metallographical laboratory for isotope research.
  - d. The other buildings house test installations for precision mechanics, numerous special laboratories comprising almost all fields of science such as optics, acoustics, pyrometrics, high and low frequency techniques, organic and anorganic chemistry, radiation measurements etc., a high tension laboratory and a particularly important laboratory for work on maximum tensions with a 2 MW-van-de-Graaf-generator, a design and computing bureau, a small drawing room and a very large and extremely well equipped photographic laboratory.
2. The technical equipment of all laboratories is modern and in generous supply. Approximately ten percent is Soviet-made, and the rest are East German products.
  3. The personnel of the Institute at present includes approximately 70 technicians and scientists, among them about 20 to 25 women, 3 typists and perhaps 15 unskilled workers.
  4. The Institute concentrates on electronic and ionic physics, nuclear physics and hypermicroscopy. Site, buildings and equipment are Ardenne's private property; he receives state subsidies only in the form of research orders from the Deutsche Akademie der Wissenschaften (German Academy of Sciences) (DAdW) in Berlin. Most of the research and development work is done on his own initiative, at his own risk and cost. The Institute is financed by selling fully developed working procedures and equipment ready for production to manufacturing firms. Ardenne also cooperates and shares development costs with other institutes of the DAdW, if the capacity of his own institute is insufficient; for example, for the development and construction of a big installation for magnetic isotope separation in the Miersdorf Nuclear Physics Institute of the DAdW. For this installation, Ardenne developed, among other equipment, the ion source and the catcher, plus stabilized tension sources, while the VEB Vakutronik built the vacuum chamber with the pump installations and also delivered the separation magnet plus stabilizing equipment.
  5. a. The Institute also collects measuring data, physical values and constants for completion and correction of the two existing volumes and for preparation of a third volume of Ardenne's "Synopsis on Electronics, Ion Physics and Super-microscopy" (Tabelle der Elektronenphysik, Ionenphysik und Uebermikroskopie).  
b. The development of a micro-oscillograph with a writing spot diameter of few  $\mu$  and of the auxiliary equipment for single and periodic ray deflection can be regarded as temporarily terminated. Development work had been under way since 1952,

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during Ardenne's stay in the USSR. The micro-oscillograph is now being manufactured by Vakutronik and was recently shown in Leipzig for the first time.

- c. A high-tension micro-oscillograph of analyzing the front of migrating waves is almost ready for serial production and will be manufactured by Vakutronik after completion of development work.
- d. Development of a radioactive thickness measuring device designed in cooperation with Dr. Schnabel of Zeiss and mentioned in the 1958 Leipzig Fair Report is also nearly completed. Carl Zeiss, Jena, will produce this extremely sensitive apparatus.
- e. Two gamma ray devices with cobalt and thallium isotopes as radiators are also being developed. One is designed for therapeutic purposes in medicine, and the other for non-destructive material testing. Serial production will be made by the Dresden Transformer and X-ray Plant.
- f. Research on the function of the thyroid gland is being carried out by means of radio iodine (Radiojod) and with the help of all necessary measuring equipment.
- g. Development of a miniature transistor transmitter and an isotope transmitter has been completed. For detailed information see May 1958 issue of Nature.
- h. A new type of astronomical map is being developed which uses luminous paints. The procedure, which was discovered "incidentally" by Ardenne and on which he has devoted many years' work, is based on the fact that luminous paints possess a contrast range of up to 1000:1 and more, which is about the same as stars appear to the eye on a dark night. A normal projection of the heavens shows the light of the stars either too weak, or, with correct light intensity, much too large. The fluorescent color method also has the advantage of reproducing the color characteristic of the stars (red, green, blue). The important punctiformity of the star reproduction and the natural light intensity can be obtained through the choice of appropriate luminous materials with extremely high fluorescent light intensity.

The luminous materials are applied to paper from which the "stars" are cut in the correct size; the "stars" are then mounted on the background, which has been coated with a black dry pigment - synthetic resin mat varnish. In order to achieve the correct light values of the "stars", they are measured and compared with the originals. The natural light values of stars from -1.6 to 6 magnitudes range to 1100:1, which is obtainable only with luminous paints.

Ordinary and special luminous paints are supplied by the Leuchtstoffwerk (factory producing fluorescent materials) in Bad Liebenstein, with polyvinyl alcohol being used as a binding agent.

Paper symbols with a size of 1 mm<sup>2</sup> are used for stars between +4 and +6, with a size of 4 mm<sup>2</sup> for stars between 0 and +3, and with a size of 6 mm<sup>2</sup> for Sirius, the brightest

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[redacted]

star. Bright nebulas and the galaxy are reproduced by spraying strongly diluted varnish of a fluorescent substance onto the celestial map. Quartz-burners whose visible components have been filtered out by double Schott glasses "G 2" are used for illumination purposes. [redacted]

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[redacted]

[redacted] for example, lunar maps and maps of the earth's surface, for which luminous paints had been used and which were of such plasticity as had so far only been achieved through stereoscopic methods. Because of its simplicity, Ardenne's method of star reproduction is adaptable to training in geography and astronomy, both in the civil and the military field.

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CLASSIFICATION

COUNTRY GDR

REPORT

SUBJECT Manfred-von-Ardenne-Research  
Institute in Dresden

DATE OF REPORT 23 July 1958

LAST REPORT ON SUBJECT  
(If applicable)

ANNEXES

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1. a. A report of early March 1958 stated that the Manfred-von-Ardenne Institute is located in Dresden-Weisser Hirsch, Plattenleite 27-31, near the cable railroad. It includes two rather large three-storied villas, two relatively small two-storied two-family houses, some annexes, plus an underground laboratory for research on the compensation of the zero-effect which influences radiation measurements. Adjacent to the street is a small round building which serves Ardenne's hobby, astronomy, and is fitted out as an observatory with a 4 meters' cupola. The optical equipment consists of several small tripod telescopes, a refractor with an eight-inch Zeiss objective and a four-inch guiding telescope. On fixed days, this observatory with its modern technical equipment is opened to the public which uses it a great deal

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the whole laboratory and private equipment had been shipped from Berlin-Lichterfelde to the USSR from where it was sent back complete to Dresden. All institute buildings are equipped with laboratories and pilot installations.

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- b. One of the two two-family houses contains a few private laboratories, Ardenne's study and the institute's office; the rest of the space is used as a private apartment. The cellar of this house accommodates a roomy, well equipped chemical laboratory, particularly for work on illuminants (luminescence, fluorescence, and phosphorescence tests). It has a power-driven darkening installation and can be lighted with double-UV-filtered quartz-burners so that color-reactions occurring during the tests can be observed at once. There is also a laboratory for experiments with luminous paints.

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  - d. The other buildings house test installations for precision mechanics, numerous special laboratories comprising almost all fields of science such as optics, acoustics, pyrometrics, high and low frequency techniques, organic and anorganic chemistry, radiation measurements etc., a high tension laboratory and a particularly important laboratory for work on maximum tensions with a 2 Mw-van-de-Graaf-generator, a design and computing bureau, a small drawing room and a very large and extremely well equipped photographic laboratory.
2. The technical equipment of all laboratories is modern and in generous supply. Approximately ten percent of it are Soviet-made, [redacted] and the rest are East German products [redacted]
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- d. Development of a radioactive thickness measuring device designed in cooperation with Dr. Schnabel of Zeiss and already mentioned in the 1958 Leipzig Fair Report is also nearly completed. Carl Zeiss, Jena, will produce this extremely sensitive apparatus.
- e. Two gamma rays devices with cobalt and thallium isotopes as radiators are also being developed. One is designed for therapeutical purposes in medicine, and the other for non-destructive material testing. Serial production will be made by the Dresden Transformer and X-ray Plant.
- f. Research on the function of the thyroid gland is being carried out by means of Radio iodine and with the help of all necessary measuring equipment.
- g. Development of a miniature transistor transmitter and an isotope transmitter has been completed. For detailed information see May 1958 issue of "Nature".
- h. A new procedure for the imitation of astronomical constellations by means of luminous paints is based upon the fact that these paints have a contrast range of up to 1000 : 1 and more, which more or less corresponds to the range of sidereal luminous power extending from -1.6 to 6 of up to 1100 : 1. While normal projection of the sidereal sky allows only distorted reproduction of the relative luminous power of each star, luminous paints provide correct reproduction and offer the additional advantage of bringing out the color shade of the stars (red, green, or blue). Thus, luminous paints are an adequate means for the exact proportional reproduction of the size and sidereal luminous power of each star. The desired result is achieved by spreading luminous paints on paper from which the star symbols are cut in appropriate size and pasted upon a celestial map covered with a mixture of black dry pigment with synthetic resin mat varnish. The quality of luminous paint used for a star symbol depends on the luminous power of the corresponding star. Ordinary and special luminous paints are supplied by the Leuchtstoffwerk (factory producing fluorescent materials) in Bad Liebenstein, with polyvinyl-alcohol being used as binding agent. Paper symbols with a size of 1 mm<sup>2</sup> are used for stars between +4 and +6, with a size of 4 mm<sup>2</sup> for stars between 0 and +3, and with a size of 6 mm<sup>2</sup> for Sirius, the brightest

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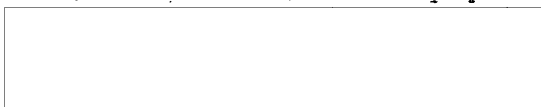
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